European Commission

International Agency for Research on Cancer
World Health Organization

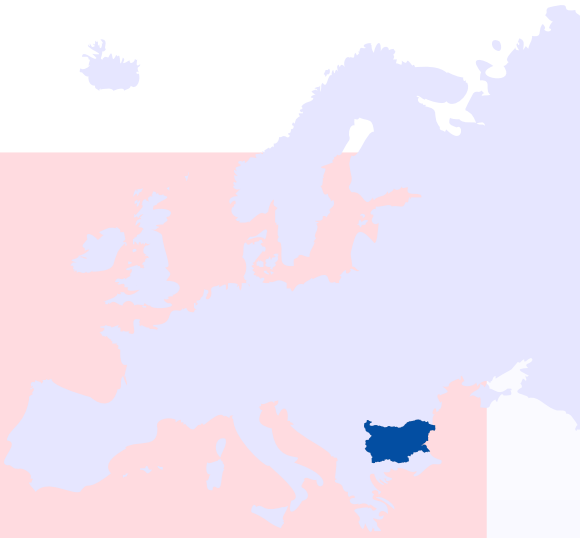
Erasmus MC

Country Factsheet Series

Socio-economic inequalities in cancer mortality across the EU27, Norway and Iceland

Bulgaria

Key messages



In Bulgaria, total cancer mortality rates in 2015–2019* were slightly higher than the corresponding European average in men and slightly lower in women. Mortality rates were higher in men compared to women and varied substantially across educational levels, according to a social gradient, with a progressive increase as educational levels decreased. Educational inequalities in cancer mortality were highest for lung and cervical cancer, but a clear social gradient was found for most selected cancer types in both sexes, except for breast cancer. Bulgaria's cancer expenditure remains among the lowest in the EU. The National Recovery and Resilience Plan aims to enhance healthcare infrastructure, improve screening coverage, and promote digital health solutions. However, persistent regional and socio-economic disparities and financial barriers continue to hinder equitable access to cancer services.

Educational inequalities in total cancer mortality

In Bulgaria, mortality rates for total cancer** in 2015–2019 were 509 per 100,000 among men and 273 per 100,000 among women. There was a clear social gradient for both sexes, with individuals with low educational attainment bearing the greatest mortality burden. Men with primary education had mortality rates over two times higher than those with tertiary education (722 vs 326 per 100,000). This gradient was milder among women, with mortality rates among those with primary education that were about 50% higher compared to those with tertiary education (359 vs 234 per 100,000).

The inequality gap (i.e., the difference in mortality rates between primary and tertiary education) in cancer mortality in Bulgaria exceeded the corresponding European average***, especially for men. This gap was also higher than that in all Southern/Western European countries, but lower compared to other Central/Eastern European countries such as Romania and Estonia.

* In Bulgaria, estimates of cancer mortality by education level were obtained using the "back-calculation" method which consists in borrowing information from countries with observed data in the same geographical area, specifically Hungary, Lithuania, Estonia. See methodological notes at the end and the Methodological report for more information.
** All cancers combined
*** European average is calculated considering 27 EU Member states + Norway and Iceland

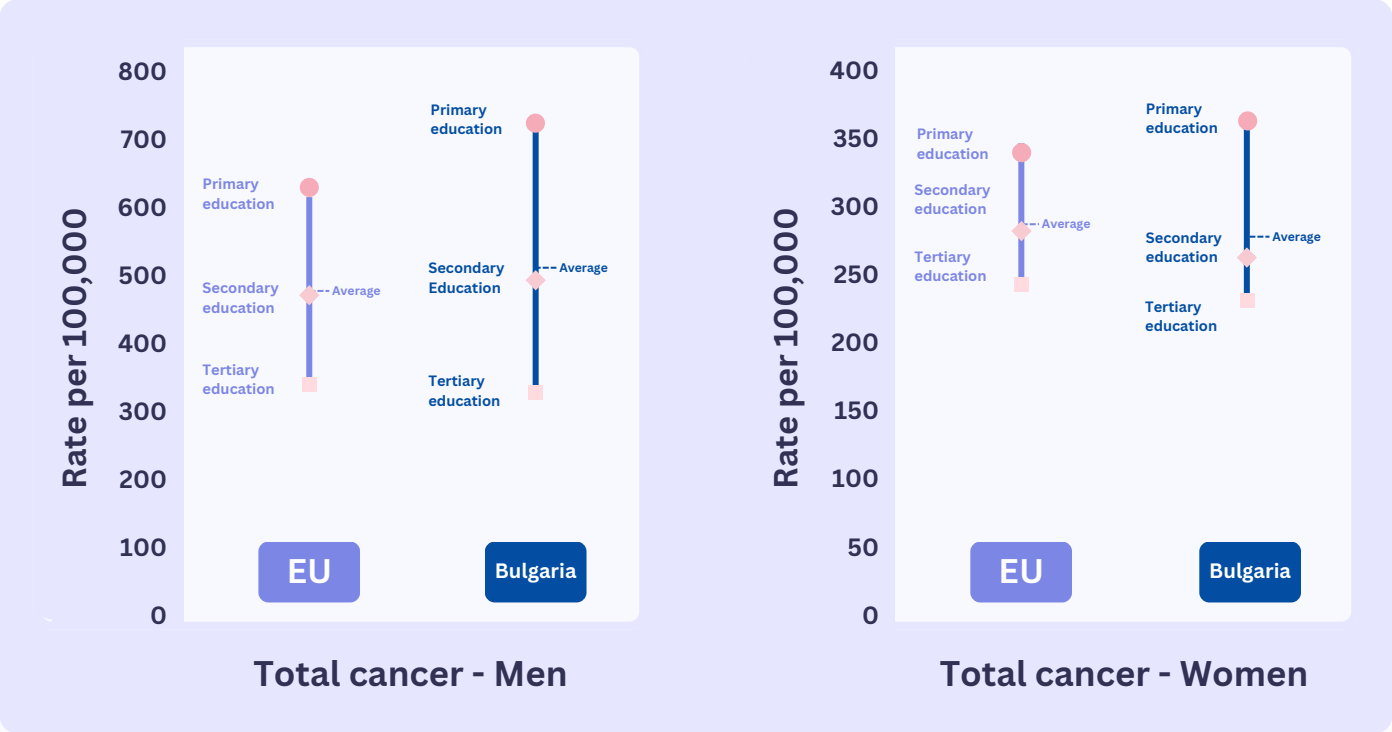


Figure 1. Total cancer mortality by sex and education level

Educational inequalities in mortality by cancer site

Lung cancer

Lung cancer mortality in Bulgaria was higher than the European average for men but lower among women. Mortality rates of lung cancer were over four times higher in men than in women. A pronounced social gradient was observed, with primary education associated with the highest mortality rates. Considering the long lag between smoking and the development of lung cancer, the sex and socio-economic differences in lung cancer mortality observed during 2015–2019 may partly reflect smoking patterns from years or decades earlier. In 1997, smoking rates were higher among men (38%) compared to women (17%), although inequalities across educational level were not particularly marked [1, 2]. Also, exposure to air pollution is an important risk factor for lung cancer in Bulgaria , with people of low socio-economic position more likely to be impacted by it [2]. Reducing air pollution is critical to reducing the future burden of lung cancer and related inequalities.

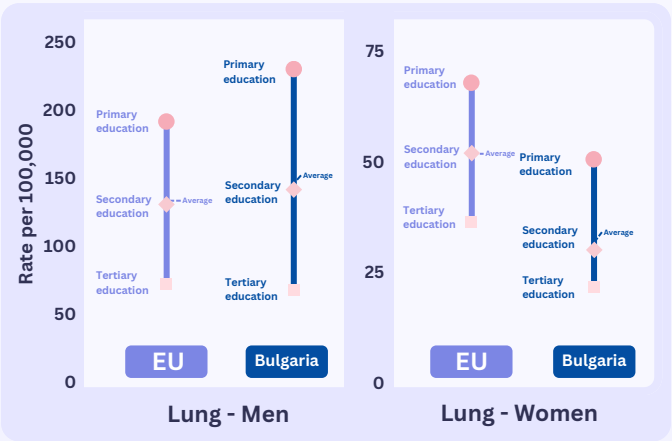


Figure 2.a. Cancer-specific mortality by sex and education level: lung

Colorectal and stomach cancers

Colorectal and stomach cancer mortality in Bulgaria exceeded the European average in both sexes. A social gradient was observed for both cancers and sexes, with mortality rates increasing as educational levels decreased. Rates were higher in men compared to women for both cancer sites. The observed inequalities in mortality could be, at least partly explained by past disparities in alcohol consumption, obesity, access to diagnosis and treatment services [2], Helicobacter pylori infection at younger ages (for stomach cancer) and screening (for colorectal cancer) [3]. Recent alcohol consumption in Bulgaria is higher that the EU average, and hazardous alcohol drinking is more common among men and individuals with low educational attainment (1.7%) compared to those with higher education (0.7%) [2]. Moreover, screening rates for colorectal cancer in Bulgaria are the lowest in the EU. In 2019, individuals aged 50-74 years with primary education reported the highest non-participation rates (97%) for colorectal cancer screening compared to those with secondary (94%) and tertiary education (92%)[4].

Breast cancer

Breast cancer mortality rates in Bulgaria were comparable to the European average and did not show a clear social gradient. In Bulgaria, women aged 50-69 years with higher education are more likely to participate in breast cancer screening programs (52% vs 17% in 2019 among those with high and low educational levels, respectively) [1]. In addition, women with lower education levels often experience barriers such as delayed diagnosis and limited access to prompt treatment. Conversely, reproductive factors associated with increased breast cancer risk—such as fewer children, later age at first childbirth, and greater use of hormone replacement therapy—are more prevalent among highly educated women. These opposing influences may lead to an overall equilibrium in breast cancer mortality rates across different educational groups.

Prostate cancer

Prostate cancer mortality rates were slightly lower than the European average. A clear social gradient was observed, with lower education correlating with higher mortality rates. Inequalities in the stage of diagnosis, access and use of diagnostic and treatment services might have contributed to these unequal patterns for the disease [5].

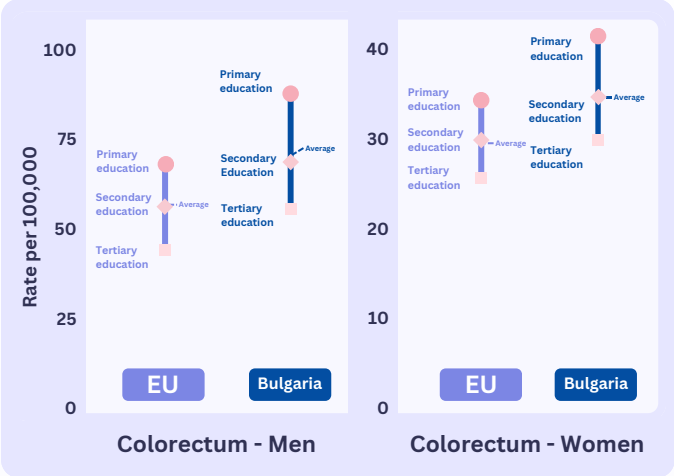


Figure 2.b. Cancer-specific mortality by sex and education level: colorectum

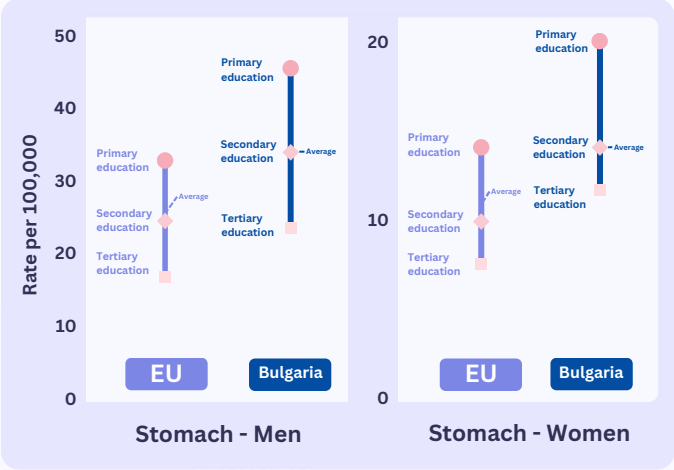


Figure 2.c. Cancer-specific mortality by sex and education level: stomach

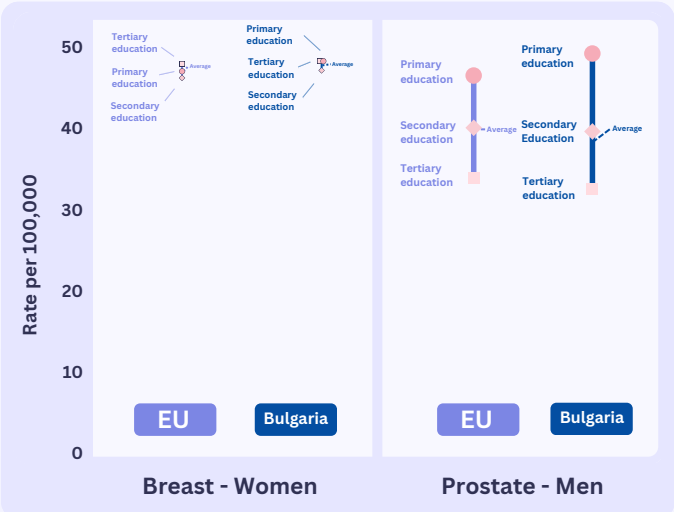


Figure 2.d. Cancer-specific mortality by sex and education level: breast (left), prostate (right)

Cervical cancer

Cervical cancer rates in Bulgaria were higher than the EU average, exhibiting a pronounced social gradient, with mortality rates decreasing as educational levels increased. Bulgaria had one of the lowest cervical cancer screening participation rates in the EU in 2019, with 45% of women aged 20-69 years with primary education reporting to have never had a cervical smear test, compared to 23% of women with secondary education and 13% of women with tertiary education [4]. Disparities in access and use of cervical cancer screening programmes likely contributed to the observed disparities in cervical cancer mortality. The equitable implementation of human papillomavirus (HPV) vaccination and HPV-based screening at large scale in the country might contribute in reducing the future burden of the disease and related inequalities.

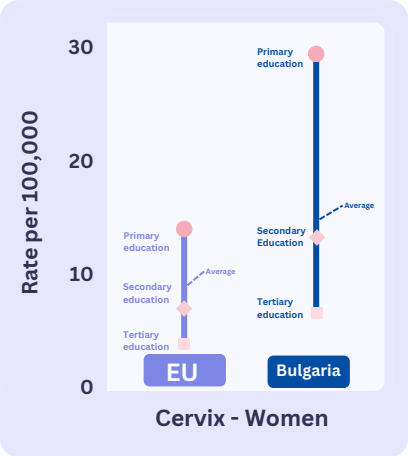


Figure 2.e. Cancer-specific mortality by education level: cervix

Methodological notes:

Findings are based on the ERAINHE dataset, which includes mortality data by educational attainment, age group, sex, period, country and cause of death. For most countries, the data are derived from individually-linked records, collected and harmonized in different periods in different projects (for the full description see the Methodological report). Geographical and temporal gaps in the ERAINHE dataset were addressed using complementary data sources and appropriate estimation methodologies tailored to the availability of the data. Age-standardised (European Standard Population) mortality rates by educational level for individuals aged 40–79 years were thus estimated for 2015–2019, using four different methods:

- **Method for group A countries,** for countries with at least 3 recorded observations over different periods of time: actual observed data for 2015-2019 (when available) or projections based on linear regression models;
- **Method for group B countries,** for countries with 1 or 2 recorded observations only: incomplete data combined with trends from other databases;
- **Method for group C countries,** for countries with no observations for certain cancer sites: integration of data from different databases with information from countries in the same geographical area;
- **"Back-calculation" method,** for countries without available data in the ERAINHE dataset: combination of population a mortality data from different databases with information on educational inequalities in cancer from countries in the same geographical area.

For Bulgaria, the "back-calculation' method was used.
Disclaimer: As this method also integrates information from countries within the same geographical area, the degree of uncertainty associated with the estimates is higher compared to estimates based solely on national data.

Contact information

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